



MOTOROLA

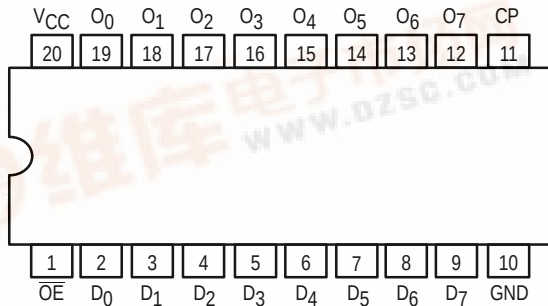
OCTAL D-TYPE FLIP-FLOP WITH 3-STATE OUTPUTS

The MC74F574 is a high-speed, low-power octal D-type flip-flop featuring separate D-type inputs for each flip-flop and 3-state outputs for bus oriented applications. A buffered clock (CP) and Output Enable ($\overline{OE}$) are common to all flip-flops.

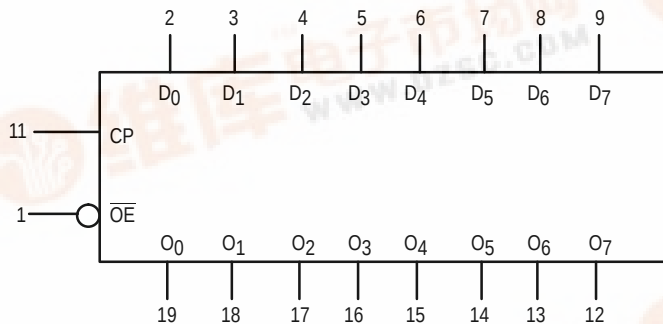
This device is functionally identical to the F374 except for the pinouts.

- Broadside Pinout Version of F374
- Edge-Triggered D-Type Inputs
- Buffered Positive Edge-Triggered Clock
- 3-State Outputs for Bus Oriented Applications
- ESD Protection > 4000 Volts

PIN ASSIGNMENT



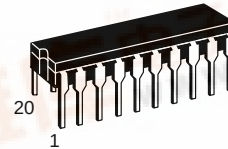
LOGIC SYMBOL



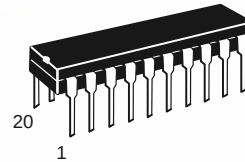
MC74F574

**OCTAL D-TYPE FLIP-FLOP
WITH 3-STATE OUTPUTS**

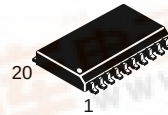
FAST™ SCHOTTKY TTL



J SUFFIX
CERAMIC
CASE 732-03



N SUFFIX
PLASTIC
CASE 738-03



DW SUFFIX
SOIC
CASE 751D-03

ORDERING INFORMATION

MC74FXXXJ Ceramic
MC74FXXXN Plastic
MC74FXXXDW SOIC

GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V _{CC}	DC Supply Voltage	74	4.5	5.0	5.5	V
T _A	Operating Ambient Temperature Range	74	0	25	70	°C
I _{OH}	Output Current — High	74	—	—	3.0	mA
I _{OL}	Output Current — Low	74	—	—	24	mA



MC74F574

FUNCTION TABLE

Inputs			Internal Register	Outputs	Operating Mode
$\overline{OE}$	CP	D_n		Q_0-Q_7	
L L	$\uparrow$ $\uparrow$	L h	L H	L H	Load and read register
L	∇	X	NC	NC	Hold
H H	$\uparrow$ X	D_n X	D_n X	Z Z	Disable outputs

H = HIGH voltage level
 h = HIGH voltage level one set-up time prior to the Low-to-High clock transition
 L = LOW voltage level
 l = LOW voltage level one set-up time prior to the Low-to-High clock transition
 NC = No change
 X = Don't care
 Z = High impedance "off" state
 $\uparrow$ = Low-to-High clock transition
 ∇ = Not a Low-to-High clock transition

FUNCTIONAL DESCRIPTION

The MC74F574 consists of eight edge-triggered flip-flops with individual D-type inputs and 3-state true outputs. The buffered clock and buffered Output Enable are common to all flip-flops. The eight flip-flops will store the state of their individual D inputs that meet the setup and hold times requirements

on the LOW-to-HIGH Clock (CP) transition. With the Output Enable ($\overline{OE}$) LOW, the contents of the eight flip-flops are available at the outputs. When the $\overline{OE}$ is HIGH, the outputs go to the high impedance state. Operation of the $\overline{OE}$ input does not affect the state of the flip-flops.

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

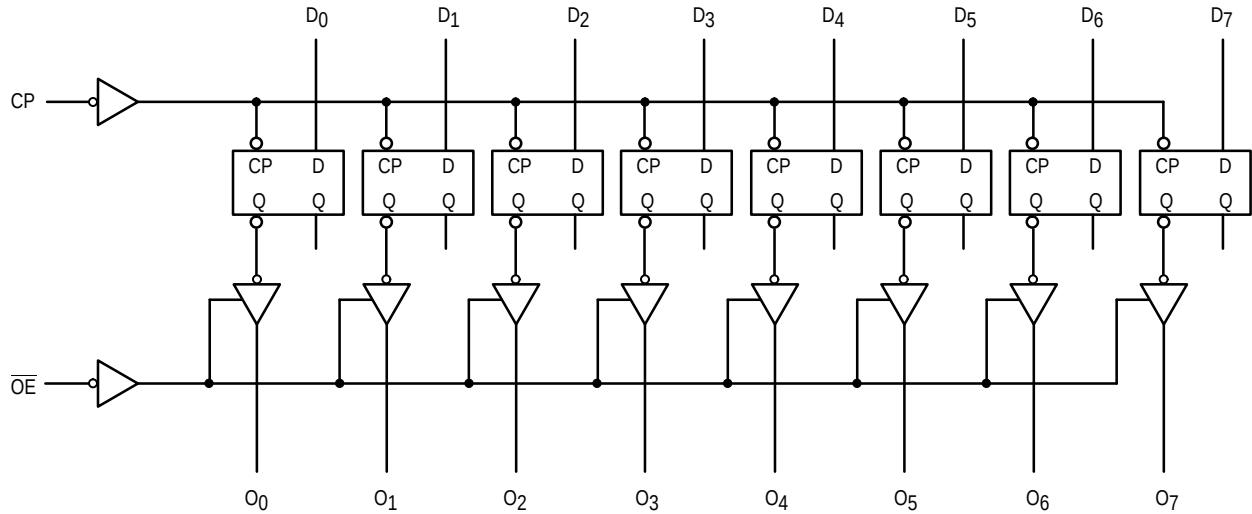
Symbol	Parameter	Limits			Unit	Test Conditions (Note 1)	
		Min	Typ	Max			
V_{IH}	Input HIGH Voltage	2.0	—	—	V	Guaranteed Input HIGH Voltage	
V_{IL}	Input LOW Voltage	—	—	0.8	V	Guaranteed Input LOW Voltage	
V_{IK}	Input Clamp Diode Voltage	—	—	−1.2	V	$V_{CC} = \text{MIN}$, $I_{IN} = -18 \text{ mA}$	
V_{OH}	Output HIGH Voltage	2.4	—	—	V	$I_{OH} = -3.0 \text{ mA}$	$V_{CC} = \text{MIN}$
		2.7	—	—	V		$V_{CC} = 4.75 \text{ V}$
V_{OL}	Output LOW Voltage	—	—	0.5	V	$I_{OL} = 24 \text{ mA}$	$V_{CC} = \text{MIN}$
I_{IH}	Input HIGH Current	—	—	20	μA	$V_{CC} = \text{MAX}$, $V_{IN} = 2.7 \text{ V}$	
		—	—	100		$V_{CC} = \text{MAX}$, $V_{IN} = 7.0 \text{ V}$	
I_{IL}	Input LOW Current	—	—	−0.6	mA	$V_{CC} = \text{MAX}$, $V_{IN} = 0.5 \text{ V}$	
I_{OZH}	Output Off Current — HIGH	—	—	50	μA	$V_{CC} = \text{MAX}$, $V_{OUT} = 2.7 \text{ V}$	
I_{OZL}	Output Off Current — LOW	—	—	−50	μA	$V_{CC} = \text{MAX}$, $V_{OUT} = 0.5 \text{ V}$	
I_{OS}	Output Short Circuit Current (Note 2)	−60	—	−150	mA	$V_{CC} = \text{MAX}$, $V_{OUT} = 0 \text{ V}$	
I_{CCZ}	Power Supply Current (All Outputs OFF)	—	55	86	mA	$V_{CC} = \text{MAX}$	$D_n - \text{GND}$; $\overline{OE} = 4.5 \text{ V}$

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.
- Not more than one output should be shorted at a time, nor for more than 1 second.

MC74F574

LOGIC DIAGRAM



AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	54/74F			74F		Unit
		T _A = +25°C V _{CC} = +5.0 V C _L = 50 pF			T _A = 0°C to +70°C V _{CC} = +5.0 V ±10% C _L = 50 pF		
		Min	Typ	Max	Min	Max	
f _{MAX}	Maximum Clock Frequency	100	—	—	70	—	MHz
t _{PLH} t _{PHL}	Propagation Delay CP to O _n	2.5 2.5	— —	8.5 8.5	2.5 2.5	8.5 8.5	ns
t _{PZH} t _{PZL}	Output Enable Time	3.0 3.0	— —	9.0 9.0	2.5 2.5	10.0 10.0	ns
t _{PHZ} t _{PLZ}	Output Disable Time	1.5 1.0	— —	5.5 5.5	1.5 1.0	6.5 6.5	ns

AC OPERATING CHARACTERISTICS

Symbol	Parameter	54/74F			74F			Unit
		$T_A = +25^{\circ}\text{C}$ $V_{CC} = +5.0\text{ V}$ $C_L = 50\text{ pF}$			$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} = +5.0\text{ V } \pm 10\%$ $C_L = 50\text{ pF}$			
		Min	Typ	Max	Min	Typ	Max	
$t_{S(H)}$ $t_{S(L)}$	Setup Time, HIGH or LOW D _n to CP	2.5 2.0	— —	— —	2.5 3.0	— —	— —	ns
$t_{h(H)}$ $t_{h(L)}$	Hold Time, HIGH to LOW D _n to CP	2.0 2.0	— —	— —	2.0 2.0	— —	— —	ns
$t_{w(H)}$ $t_{w(L)}$	CP Pulse Width HIGH or LOW	5.0 5.0	— —	— —	5.0 5.0	— —	— —	ns